



NTSB National Transportation Safety Board

Runway Incursions:

Moving Toward

A Better Solution

Presentation to: AAAE Runway
Safety Summit

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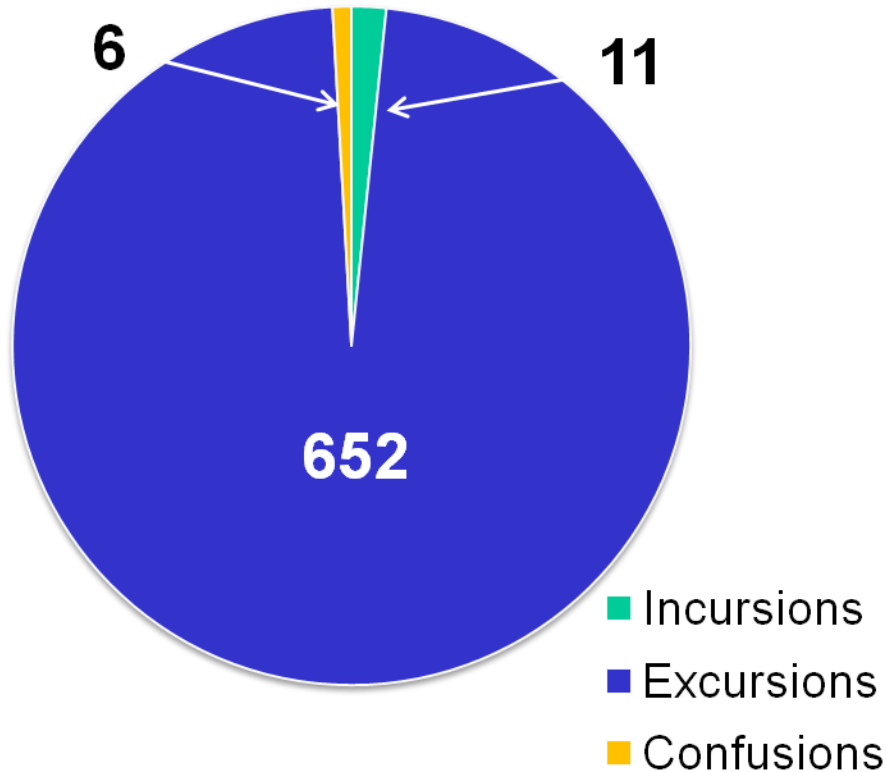
Date: December 3, 2012

NTSB 101

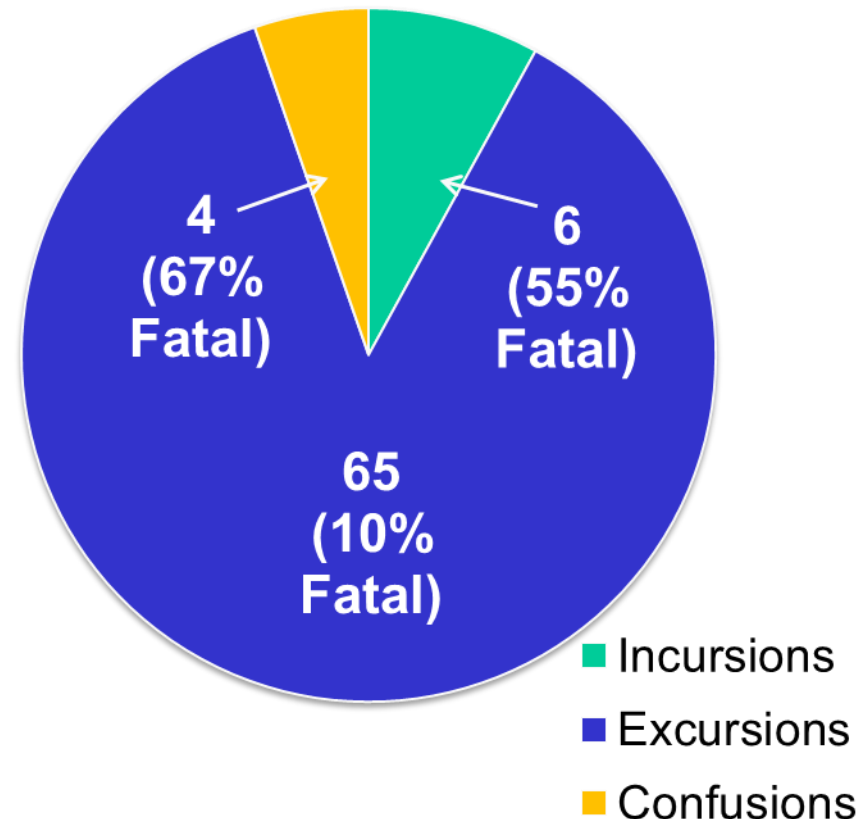
- Independent agency, investigate transportation accidents
- Determine probable cause(s) and make recommendations to prevent recurrences
- Single focus is **SAFETY**
- Primary product: Safety recommendations
 - Acceptance rate > 80%

Runway Accidents, 1995-2010

All Runway Accidents



Fatal Runway Accidents

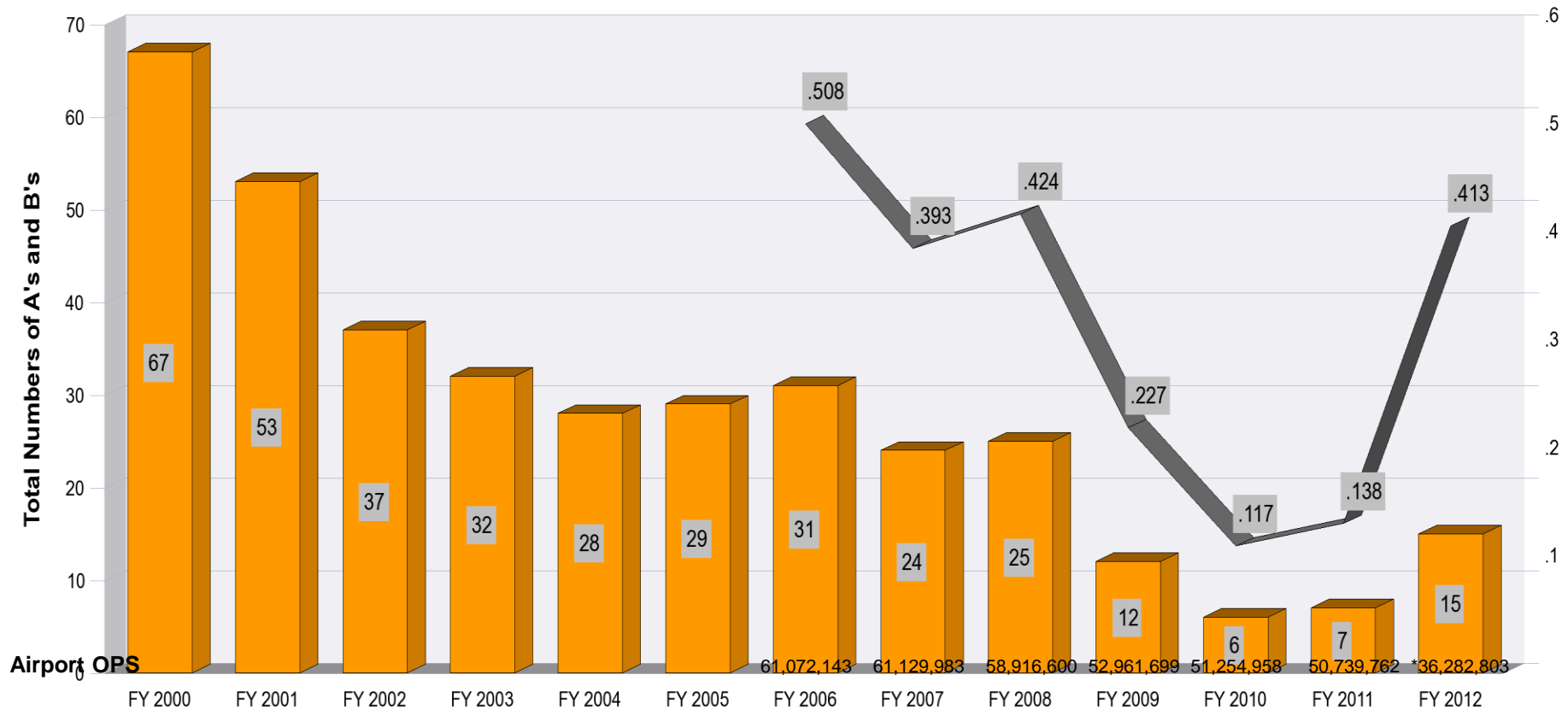


Note: Of 1429 accidents involving major or substantial damage from 1995-2008, 431 (30%) were runway related

So Why Emphasize Incursions?

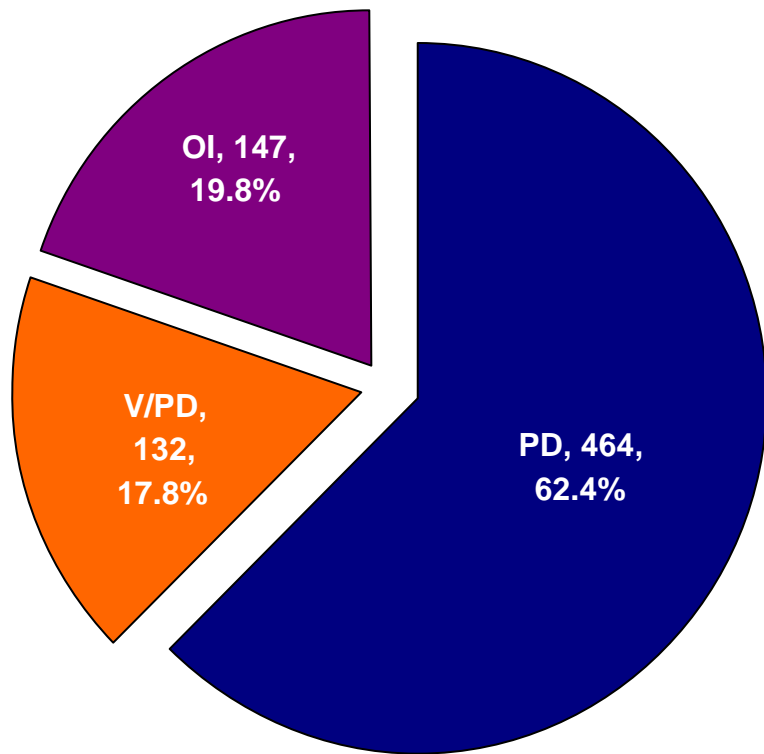
- **Historic**
 - Worst accident in aviation history (Tenerife: 583 fatalities)
- **Low probability but high consequence**
 - Airliner to airliner
- **Demand will grow more than capacity**
 - More airplanes
but
 - No new airports (and very few new runways)
- **Increasing communications challenges**
 - More traffic
 - More extensive taxi instructions
 - Hold short for every runway

Category A and B Runway Incursions

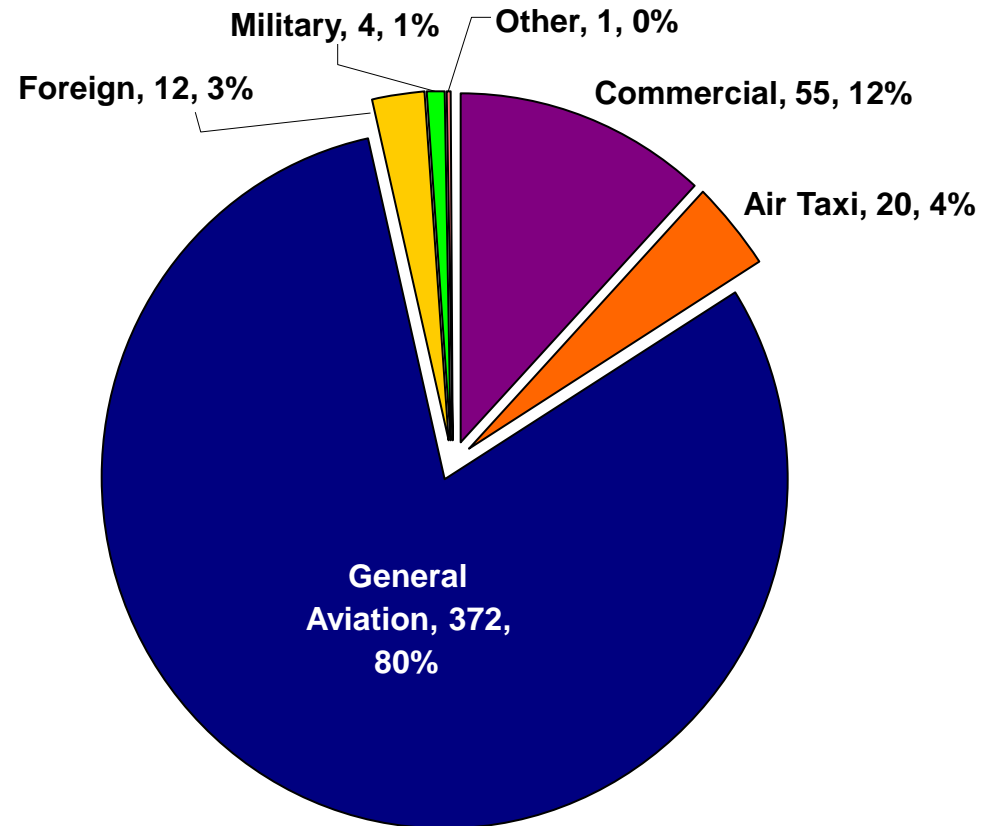


* As of June 26, 2012

Incursion Numbers and Rates



743 Runway Incursions



464 Pilot Deviations

Source: FAA, 1 Oct 2011 – 30 June 2012

The Paradigm Shift

- **Previous Response: Punishment**
 - Mostly pilots
 - Sometimes controllers
- **The Good News: Runway Safety Council**
 - Objective: Identify and fix problems, rather than punish
 - Collaborative activity, including FAA, airlines, labor, AOPA, and others
 - Quarterly meetings to determine root causes, re most recent RI's, make recommendations
 - Follow up on recommendations

Sample of Results

- **Inclusion of chapter re Runway Incursion Avoidance in Pilot's Handbook of Aeronautical Knowledge**
- **Progress toward inclusion of runway incursion material in**
 - **Practical Test Standards**
 - **Instructor training**
 - **Part 142 curriculum**
- **Changes in ATC procedures**
- **Changes re airport signs and markings**

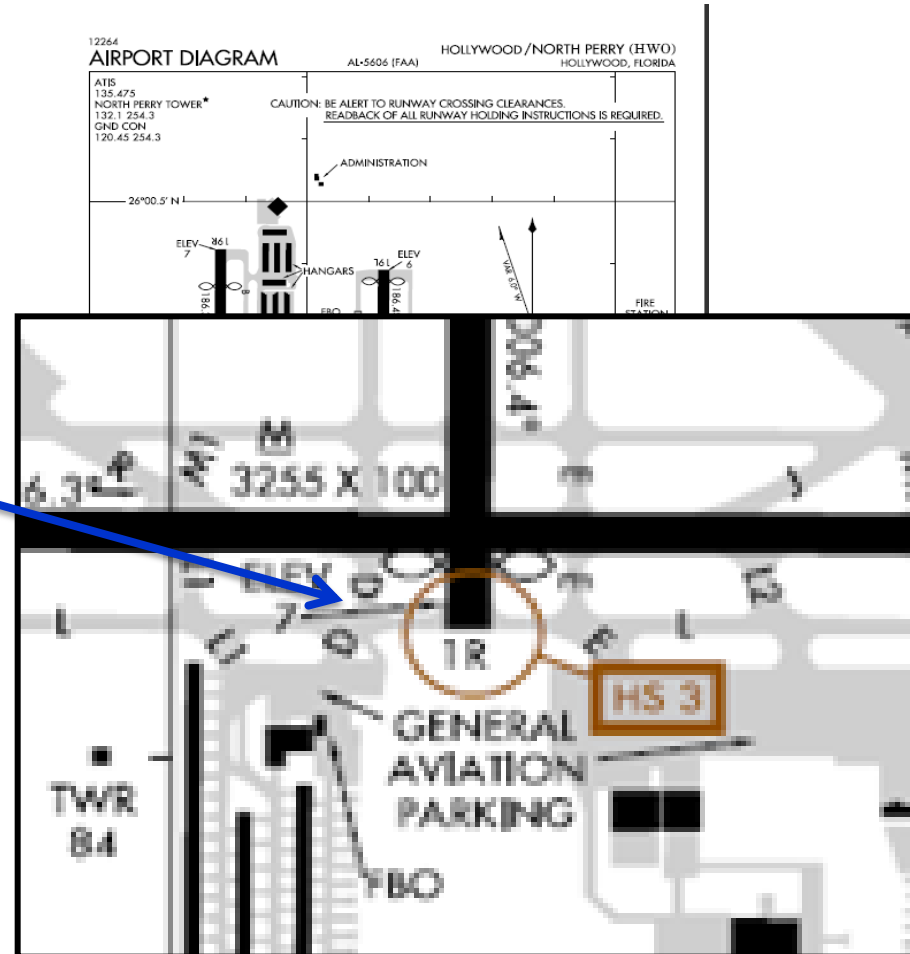
Problems and Solutions: Airport Chart

- Have it**
 - Incursion due to pilots unfamiliar, no chart
 - Pilots can get charts online
 - Encourage FBOs to provide charts

- Understand it (especially “Hot Spots”)**
 - Incursion due to missed turn while programming FMS
 - Incursion due to unawareness of “gotcha”
 - Incursion due to failure to clarify confusing clearance
 - Wrong runway due to inadequate awareness of geometry

Unawareness of “Gotcha”

***Note entry onto
runway
immediately
after right turn
out of FBO ramp***



Expectation Bias

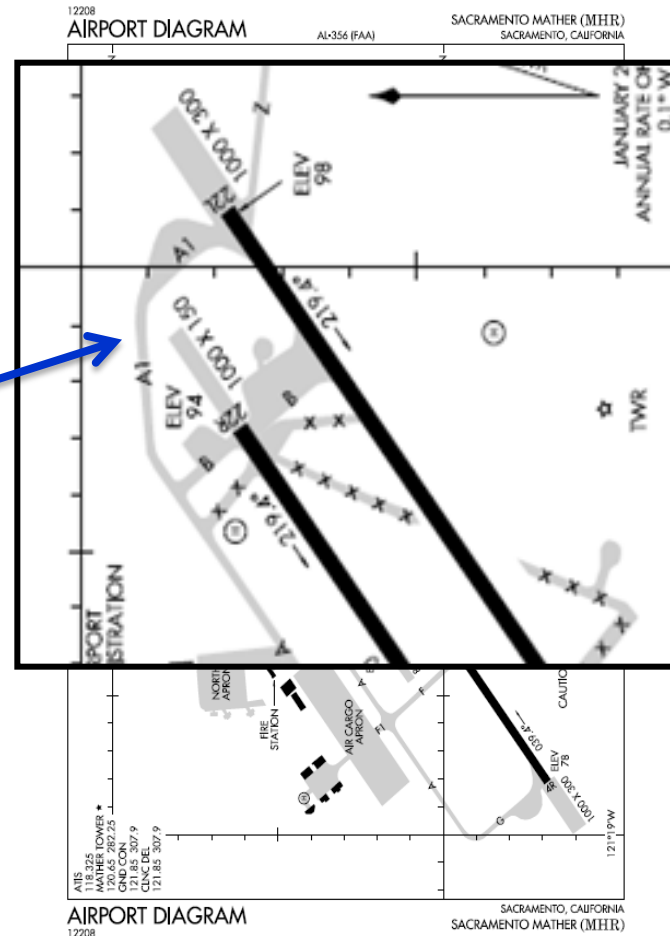
(Think You Hear What You Expect To Hear)

- Pilot hears clearance incorrectly**
 - Pilot told to continue approach
 - Controller in long conversation re other matter
 - Pilot landed without clearance
- No readback**
 - Pilot's readback did not specify which runway
 - Controller did not ask
 - Pilot departed on wrong runway
- Controller hears readback incorrectly**
 - Readback re non-existent intersection should have alerted controller to problem

No Readback; Wrong Runway

Note that

- Taxiway A does not go to RW 22R; must turn right onto Taxiway B
- Taxiway A becomes Taxiway A1 without turning
- Taxiway A1 goes to RW 22L



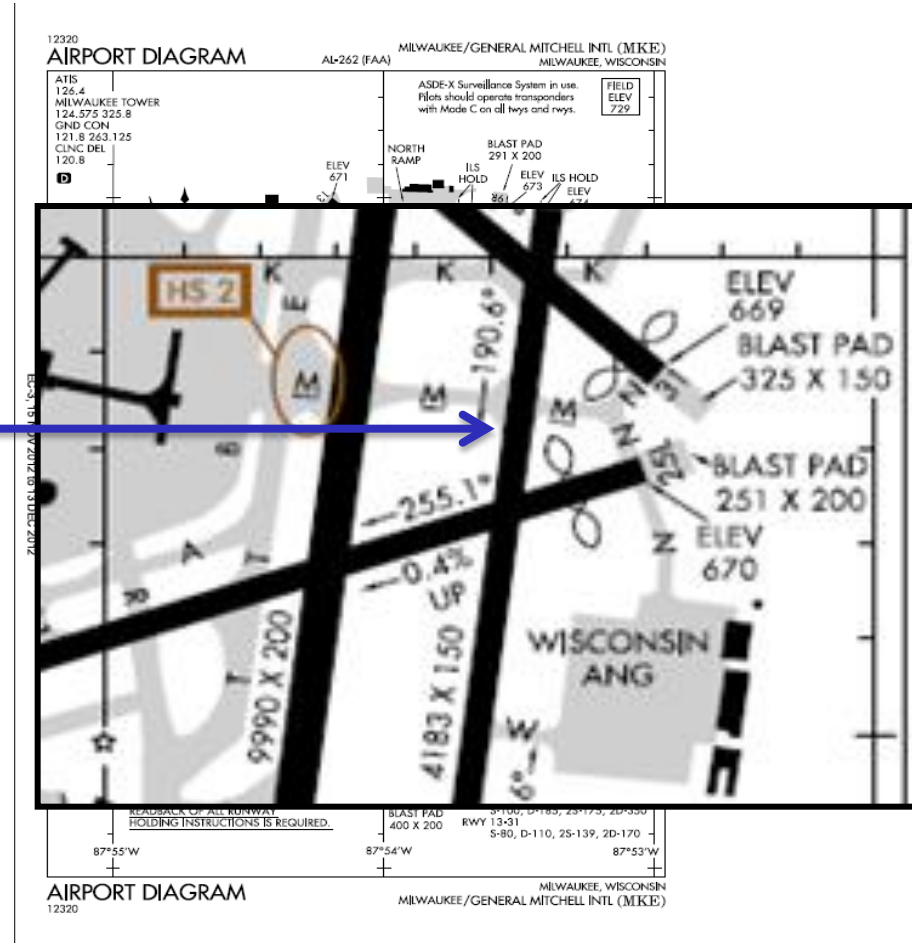
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Non-Existent Intersection

*Note that
Taxiway M
does not
intersect
RW 25L*



Abnormal Operations

– Construction

- Normal or construction lights may be inoperative
- Routes may not be well marked
- Procedures interim, may not be robust

– Other

- Stuck mike – Causal link in takeoff without clearance
- Long conversation – Resulted in landing without clearance
- Mishap at airport – Resulted in incorrect clearance (procedures not robust or well-practiced)

And Sometimes . . . People Simply *FORGET!*

- To err is human
- In *nearly half* of GA pilot deviations involving erroneously entering the runway or crossing the hold short line, the pilot received a clearance, acknowledged the clearance, and read it back correctly
- Controllers sometimes forget and issue simultaneous (conflicting) clearances

Lessons Learned

- Many of these examples involve
 - *At least one error by a pilot, and*
 - *At least one error by a controller*
- The system involves many good people trying to do the right thing, but pilots and controllers must always be alert for errors – *their own and others*
- Pilots and controllers: *Trust but verify*
- Pilots: Always use the taxi chart;
and when in doubt, *ASK!!*

Moral of the Story

*Identifying problems
and fixing them
improves safety
far more effectively
than punishment*

Thank You!!!



Questions?